UNIVERSITY OF NEBRASKA AT OMAHA

MATH 8430 Linear Programming

TU/TR 5:30-6:45pm | Dr. Fabio Vitor

Prerequisite: MATH/CSCI 4300/8306 or permission of instructor

Linear programming is one of the most important classes of optimization models. Linear programs seek to either maximize or minimize an objective function denoted by a linear cost function in terms of decision variables. This objective function is restricted to a set of linear inequality and/or equality constraints. When a linear program is optimally solved, the values attributed to the decision variables represent a solution that satisfies all constraints and provides the best possible objective function value. Some of the most useful applications of linear programs include problems in industries such as:

- Petroleum, chemical, and mining
- Transport and distribution
- Manufacturing
- Agriculture
- Finance
- Health care
- Food
- Energy



This course will study the theoretical and computational aspects of linear programs. SIGN UP FOR THIS COURSE TO LEARN MORE!

Theoretical Foundation

- Geometric interpretation of linear programs
- Convex analysis
- Polyhedral sets
- Duality theory

Simplex Method

- Basic feasible solutions
- Optimal, multiple optimal, infeasible, unbounded, and degenerate solutions
- Starting solutions and convergence
- Revised simplex method
- Simplex method for bounded variables
- Optimality conditions
- Sensitivity analysis and the dual simplex method

Interior Point Methods

- Computational complexity
- Basic polynomial time interior point algorithms
- Primal, dual, and primal-dual interior point methods
- Predictor-corrector and infeasible techniques

Degenerate solutions $Simplex Method x_1$ $Simplex Method x_1$ Interior Point Methods

Do you want to learn the impact of operations research? Visit https://youtu.be/9-MITCoka-Q

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